WHAT IS CLAIMED IS:

1.   A computer-implemented modeling system, the modeling system comprising:

5   a graphical user interface mechanism configured to display a timeframe on a computer display medium, the graphical user interface mechanism being further configured selectively to display, under user control, a representation of a selectable instance of at least one component object for a modeled entity, the representation of that component object instance as displayed with respect to the timeframe

10   representing time-related properties for the component object instance;

          the at least one component object for a modeled entity, the component object comprising a calculating engine defining the functionality of the modeled entity, the calculating engine being configured to respond to the time-related properties for the selected component object instance to perform calculations on at least one

15   component object property for deriving an output comprising a time-series of output values; and

          a result mechanism for deriving at least one result value based on the time-series of output values derived by the selected component object instance.

20   2.   The modeling system of claim 1, wherein the component object is configured to include a property in the form of at least one user definable link to another component object.

3.   The modeling system of claim 1, wherein a plurality of user selectable object

25   types are provided, each object type being for a respective modeling entity type and comprising a calculating engine defining a functionality specific to the respective modeling entity type.

4.   The modeling system of claim 1, wherein the calculating engine of the component object is configured to perform calculations on at least one property of that component object.

5.   The modeling system of claim 1, wherein the calculating engine of the component object is configured to perform calculations on at least one property of another component object.

6.   The modeling system of claim 1, wherein the time-series of output values comprises at least one value associated with at least one calculation timing.

7.   The modeling system of claim 1, wherein the display of the component object instance with respect to the timeframe represents at least an adjustable lifespan having a start time and an end time for the component object.

8.   The modeling system of claim 7, wherein the display of the component object instance with respect to the timeframe further represents at least one calculation datum point corresponding to a calculation timing for an output value of the time-series of output values.

9.   The modeling system of claim 8, wherein the calculating engine is responsive to changes in the positioning of the displayed instance of the component object to change the calculation timings for output values of the time-series of output values.

10.   The modeling system of claim 1, wherein the timeframe defines a timeline indicating time values.

11.   The modeling system of claim 10, wherein the time values are dates.

12.   The modeling system of claim 10, wherein the time values are duration offsets.

5   13.   The modeling system of claim 10, wherein the timeline extends in a first direction, and the timeframe further defines a plurality of spaced object lines parallel to the timeline, a said component object instance being defined in at least one object line.

10   14.   The modeling system of claim 13, wherein the timeline extends in a row direction, and the object lines define separate rows parallel to the timeline.

15.   The modeling system of claim 13, wherein the orthogonal correspondence between the extremities of a displayed component object instance along an object
15   line with time values of the timeline represents a start time and an end time for the component object instance.

16.   The modeling system of claim 13, configured to prevent overlapping of at least determined component object instances within an object line, whereby
20   determined component object instances displayed within an object line have non-overlapping lifespans.

17.   The modeling system of claim 13, configured to define parent-child relationships between component object instances displayed on respective object
25   lines.

18.   The modeling system of claim 13, wherein the displayed representation of the at least one component object instance is a bar.

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19.   The modeling system of claim 18, wherein at least one marker representing a calculation datum point corresponding to a calculation timing for an output value of the time-series of output values is superimposed on the bar.

5   20.   The modeling system of claim 13, wherein the displayed representation of the at least one component object instance is a series of markers, the markers representing calculation datum points corresponding to calculation timings for respective output values of the time-series of output values, the markers being joined to represent the lifespan of the component object instance from a start time to
10   an end time.

21.   The modeling system of claim 1, wherein one component object instance is associated with a modeled entity, the component object instance performing a series of calculations for respective calculation timings for generating the time-series of
15   output values.

22.   The modeling system of claim 1, wherein a plurality of component object instances are associated with modeled entity, each component object instance performing a calculation for a determined calculation timing for generating one of
20   the time-series of output values.

23.   The modeling system of claim 1, wherein at least one component object instance includes a link to a further component object instance for defining a parent-child relationship.
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24.   The modeling system of claim 23, wherein a component object instance holds properties of a component object instance which is its child.

25.   The modeling system of claim 23, wherein a component object instance is operable to obtain a property from a component object instance which is its parent.

26.   The modeling system of claim 23, wherein a component object instance is responsive to a request for output from the result mechanism to obtain, from its parent object, properties for calculating an output comprising the time-series of output values, the output values being determined at datum points defined by the time-related properties for the component object.

27.   The modeling system of claim 23, configured to define a root object with a user defined hierarchy of component objects being dependent therefrom for modeling at least one scenario.

28.   The modeling system of claim 23, wherein relationships between component object instances are represented by displaying links between respective displayed component object instances.

29.   The modeling system of claim 23, wherein the graphical user interface mechanism is operable to provide selective expansion, or contraction, of displayed sub-hierarchies of component object instances.

30.   The modeling system of claim 1, wherein a displayed instance of a component object may be selectively enabled and disabled.

31.   The modeling system of claim 30, wherein the selective enabling and disabling of a displayed instance of a component object causes enabling and disabling, respectively, of any component object which is a descendent thereof.

32.   The modeling system of claim 1, wherein the representation displayed for an object reflects the state of that object, as to whether it is in an enabled, disabled, selected, error, or other state.

5   33.   The modeling system of claim 1, wherein a model may be formed of a plurality of component models, each component model comprising one or more component objects.

34.   The modeling system of claim 1, wherein at least one property comprises an
10   array of values.

35.   The modeling system of claim 1, wherein at least one property is sub-divided into sub-properties.

15   36.   The modeling system of claim 1, wherein the graphical user interface is configured to display a plurality of icons corresponding to user selectable component object types, each component object type being for a respective modeling entity type and comprising a calculating engine defining a functionality specific to the respective modeling entity type, the icons being selectable by a user
20   for positioning a representation of a component object instance with respect to the timeframe.

37.   The modeling system of claim 1, wherein the graphical user interface is configured to display a data field for inputting properties of a component object.
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38.   The modeling system of claim 1, wherein the properties of a component object include at least one property selected from:
        a value;
        an array of values;

a time-series of values;

a state;

a Boolean;

a string;

5   a timing;

a duration;

a link;

a bit map; and

a binary stream.

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39.   The modeling system of claim 1 wherein the result mechanism comprises at least one result object for generating a report including at least output value based on at least one time-series of output values derived by at least one component object instance.

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40.   The modeling system of claim 39, wherein the report is displayable.

41.   The modeling system of claim 39, wherein the report is printed on a printer.

20 42.   The modeling system of claim 39, wherein the report is a financial report.

43.   The modeling system of claim 39, wherein the result mechanism provides at least one control value for controlling the operation of a modeled system.

25 44.   The modeling system of claim 1, operable to model alternative scenarios, wherein the at least one component object is configured to record respective properties for plural scenarios.

45.   The modeling system of claim 1, further comprising a revision mechanism operable to record revisions of the model of a scenario, the revision mechanism being operable to define a hierarchy of revision entries.

5 46.   The modeling system of claim 45, wherein a revision entry defines a previous value of a property and a current value of a property.

47.   The modeling system of claim 46, wherein the revision mechanism is configured to be responsive to selection of a revision of a model, to access the

10 linked series of revision entries selectively to remove and to reintroduce the selected revision for the current version of the model.

48.   A computer system comprising a processor, storage, a display device, at least one user input device and a program-implemented modeling tool, the modeling

15 tool comprising:

        a graphical user interface mechanism configured to display a timeframe on a computer display medium, the graphical user interface mechanism being further configured selectively to display, under user control, a representation of a selectable instance of at least one component object for a modeled entity, the representation of

20 that component object instance as displayed with respect to the timeframe representing time-related properties for the component object instance;

        the at least one component object for a modeled entity, the component object comprising a calculating engine defining the functionality of the modeled entity, the calculating engine being configured to respond to the time-related properties for the

25 selected component object instance to perform calculations on at least one component object property for deriving an output comprising a time-series of output values; and

        a result mechanism for deriving at least one result value based on the time-series of output values derived by the selected component object instance.

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49.   A carrier medium carrying a computer program-implemented modeling tool, the modeling tool comprising:

graphical user interface instructions configured to display a timeframe on a computer display medium, the graphical user interface instructions being further configured selectively to display, under user control, a representation of a selectable instance of at least one component object for a modeled entity, the representation of that component object instance as displayed with respect to the timeframe representing time-related properties for the component object instance;

component object definition instructions for defining the at least one component object for a modeled entity, the component object comprising a calculating engine defining the functionality of the modeled entity, the calculating engine being configured to respond to the time-related properties for the selected component object instance to perform calculations on at least one component object property for deriving an output comprising a time-series of output values; and

result generation instructions for deriving at least one result value based on the time-series of output values derived by the selected component object instance.

50.   The carrier medium of claim 49, wherein the carrier medium is a computer readable storage medium.

51.   The carrier medium of claim 49, wherein the carrier medium is a telecommunications medium.

52.   A computer-implemented planning system comprising a plurality of selectable objects types, each object type defining a type of planning entity and including a calculating engine for defining the functionality of the planning entity, at least a selected one of the object types including definitions of time dependent properties and a calculating engine operable to perform time-dependent operations

in response to property values for the time-dependent properties, a control mechanism defining an object hierarchy in response to user input, which user input includes specifications of property values for the time dependent properties, and for generating outputs in the form of time-series of values in response to calculations

5   performed by the calculating engines of the objects.

53.   A carrier medium carrying an object definition for a computer-implemented planning system, the object defining the functionality of a planning entity and including a definition of a time dependent property and a definition of time-

10   dependent operations configured to respond to input property values for the time-dependent properties to produce a time-series of output values.

54.   The carrier medium of claim 53, wherein the carrier medium is a computer readable storage medium.

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55.   The carrier medium of claim 53, wherein the carrier medium is a telecommunications medium.

56.   A revision mechanism for a modeling system, the revision mechanism being

20   configured:

        to record revisions of the model of the scenario including the definition of a hierarchy of revision entries, each revision entry including pointers to adjoining entries in the hierarchy and including a definition of a previous value of a property and an current value of a property; and

25   in response to selection of a revision of the model of the scenario, to access the linked series of revision entries selectively to remove and to reintroduce the selected revision for the current version of the model.

57.   A computer-implemented modeling method, the method comprising:

displaying a timeframe on a computer display medium;

displaying, under user control, a representation of a selectable instance of at least one component object for a modeled entity, the representation of that component object instance as displayed with respect to the timeframe representing

5   time-related properties for the component object instance;

causing the component object to be responsive to the time-related properties for the component object instance to perform calculations for the modeled entity on component object properties for deriving an output comprising a time-series of output values; and

10   producing at least one result value based on the time-series of output values derived by at least one component object.

58.   The method of claim 57, wherein the component object is configured to include a property in the form of at least one user definable link to another

15   component object.

59.   The method of claim 57, further comprising displaying a plurality of user selectable object types, each object type being for respective modeling entity type and being operable to define a functionality specific to the respective modeling

20   entity type.

60.   The method of claim 57, comprising positioning the component object instance with respect to the timeframe so as to define at least an adjustable lifespan having a start time and an end time for the component object.

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61.   The method of claim 57, comprising displaying at least one marker at a position for defining a calculation datum point corresponding to a calculation timing for an output value of the time-series of output values.

62.   The method of claim 57, wherein the timeframe comprises a timeline extending in a first direction and a plurality of spaced object lines parallel to the timeline.

5   63.   The method of claim 62, comprising the user specifying a lifespan for a component object by aligning the component object instance on an object line with extremities of the instance of the component object aligned with points on the timeline corresponding to the start time and end time for the component object.

10   64.   The method of claim 62, comprising displaying at least one marker at a position for defining a calculation datum point corresponding to a calculation timing for an output value of the time-series of output values, the method further including modifying the position of the marker for adjusting the calculation timing for the output value.

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65.   The method of claim 62, wherein the time-series of output values is dynamically varied in response to adjustments of the positioning of the component object instance with respect to the timeline.

20   66.   The method of claim 62, wherein the movement of at least one extremity of an instance of an object on an object line to a position occupied by an instance of another object on the object line causes the instance of the other object to be moved to avoid overlapping of adjacent instances of objects on an object line.

25   67.   The method of claim 62, comprising the derivation, under user control, of at least one parent-child relationship between instances of objects on respective object lines, the method comprising the automatic display of a representation of the parent-child relationship and the modification of the component objects to reflect the parent child relationship.

68.   The method of claim 67, further comprising a component object responding to a request for output from the result mechanism to obtain, from its parent object, an account for calculating an output comprising the time-series of output values, the

5   output values being determined at datum points defined by the time-related properties for the component object.

69.   The method of claim 57, comprising displaying a plurality of predefined object types for selection by a user for positioning with respect to the timeframe.

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70.   The method of claim 57, comprising displaying an input field for receiving input by a user of properties for a component object.

71.   The method of claim 57, comprising generating a report including at least

15   one value derived from at least one time-series of output values.

72.   The method of claim 71, comprising displaying the report.

73.   The method of claim 71, comprising printing the report.

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74.   The method of claim 71, comprising exporting the report.

75.   The method of claim 71, wherein the report is a financial report.

25   76.   The method of claim 71, comprising outputting at least one control value to a modeled system for controlling the operation of the modeled system.

77.   The method of claim 57, comprising the modeling alternative scenarios, the method including recording respective properties for plural scenarios in at least one component object.

5   78.   The method of claim 57, further comprising maintaining a revision record of revisions of the model of a scenario, the revision record including an acyclic graph of revision entries.

79.   The method of claim 78, wherein each revision entry defines a revision step
10   for a property of a component object.

80.   The method of claim 79, comprising accessing the linked series of revision entries to cause a revision to be deactivated or reactivated for the current model.